

WHAT IS CLAIMED IS:

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1. A Continuous Emission Monitoring System for fossil fuel based generators, the system comprising:  
an analyzer adapted to receive a sample flow and provide an output indicative of at least one constituent of the sample flow;  
a sample handling system coupleable to an emission source and adapted to extract an emission sample from the sample source and provide the extracted emission sample to the sample analyzer; and  
wherein the sample handling system is embodied within a single enclosure.
  2. The system of claim 1 wherein the single enclosure has two compartments which are maintained at different temperatures with respect to one another.
  3. The system of claim 2, wherein the first compartment includes a sample probe and valve, and wherein the first compartment is maintained at an elevated temperature, and wherein the second compartment includes a thermoelectric cooler.

4. The system of claim 3, wherein non-heated tubing connects the valve to the thermoelectric cooler.

5. The system of claim 1 wherein polytetrafluoroethylene tubing conveys a sample from a sample probe to the analyzer.

6. A distributed control and monitoring system comprising:

an emission monitoring system coupleable to a fossil fuel engine and an electric generator, the emission monitoring system <sup>B</sup>for acquiring emission monitoring data; and

a remote access node coupled to the emission monitoring system through a computer network, the node allowing remote access to the fossil fuel engine and the generator output.

7. The system of claim 6, wherein the remote access node comprises a remote monitoring and control node.

8. The system of claim 6, wherein the system is adapted to self-diagnose and provide one or more alerts based on the self-diagnostics.

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9. The system of claim 6, wherein the emission monitoring system further acquires generator data.

10. The system of claim 6, wherein the emission monitoring system further acquires power generation data.

11. The system of claim 6, wherein the emission monitoring system further acquires fuel data.

12. The system of claim 6, wherein the remote monitoring and control system reports emission data to a selected entity.

13. The apparatus of claim 6 and further comprising;

a second emission monitoring system coupleable to a second diesel-electric generator providing emissions information to the user interface via the computer network.

14. An electricity generation system comprising:

a first generator;  
a first controller coupled to the first generator;  
a second generator;

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a second controller coupled to the second generator; and  
a remote control and monitoring node coupled to the first and second controllers to monitor and control the first and second generators.

15. The system of claim 14, wherein the first generator includes a primary power source selected from a group consisting of a reciprocating diesel engine, reciprocating gas engine, gas turbine, steam turbine, package boiler, and waste heat boiler.

16. The system of claim 14, wherein the first controller includes an embedded personal computer (PC) controller.

17. The system of claim 14, wherein the first controller provides local monitoring and control relative to the first generator.

18. The system of claim 14, wherein the first controller senses a phase of electricity in a power grid to match a phase of electricity generated by the first generator to that of the power grid.

19. The system of claim 14, wherein the node is coupled to the first and second controllers through a communication medium selected from the group

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consisting of a wireless interface, a local area network interface, a wide area network interface, and a fiberoptic link.

20. The system of claim 14, wherein the control node includes an Application Service Provider.

21. The system of claim 14, wherein the first generator is a fossil-fuel based generator and the first controller comprises a continuous emissions monitoring system.

22. The system of claim 21, wherein the first controller measures power output of the first generator.

23. The system of claim 22, wherein the first controller measured power generation cost of the first generator.

24. The system of claim 22, wherein the first controller measures thermal efficiency of the first generator.

25. The system of claim 21, wherein the first controller is adapted to receive data indicative of a parameter of the first generator, and provide an input to the first generator based upon an optimization algorithm.

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26. The system of claim 25, wherein the parameter is selected from the group consisting of exhaust gas composition, unburned fuel in an emission stream, emission volume, emission heat, emission noise, engine speed, engine hours remaining before maintenance, engine throttle position, engine oil pressure, engine temperature, engine oil level and fuel composition.

27. The system of claim 25, wherein the input is selected from the group consisting of a start signal, a shut-down signal, and a throttle signal.

28. The system of claim 14, wherein the control node is adapted to report data relative to the system.

29. The system of claim 28, wherein the data facilitates area monitoring.

30. The system of claim 29, wherein the node adjusts the first and second generators through their respective controllers to reduce aggregate pollution.

31. The system of claim 14, and further comprising Light Detection and Ranging (LIDAR) equipment adapted to monitor an environment of the first generator.

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32. A system for generating electricity comprising:

a generator adapted to receive fuel and generate electricity and waste heat; and

a metal hydride heat pump coupled to the generator to receive the waste heat to provide cooling.

33. The system of claim 32, wherein the cooling is provided as an air conditioning system.

34. The system <sup>B</sup> of claim 32, wherein the generator is a fossil-fuel based generator.

35. The system of claim 34, and further comprising a continuous emissions monitoring system coupled to the generator and the heat pump and provide control of at least one of the generator and the heat pump based upon a chemical analysis of a monitored species.

36. The system of claim 35, wherein the monitored species is present in exhaust gas from the generator.

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